

AUDIT II

Country Report LITHUANIA

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SUMMARY OF ENERGY AUDITING

Background and Present National Policy

There were no country-wide programs targeted solely on energy auditing in Lithuania during the last decade. A number of projects and programs in residential and public sectors included energy auditing as a compulsory component of more general setup. Since 1991 up to the year 2003 around 900 energy audits have been performed in the framework of these state supported programs and projects.

Compliance with the EU legal acts, energy efficiency, wider use of indigenous, renewable and waste energy resources, reduction of greenhouse gas emissions are major directions of national energy policy, which is being updated once in every five years through the National Energy Strategy (NES). The last NES was adopted on October 10, 2002 by the Lithuanian Parliament. The National Energy Efficiency Programme (updated on September 19, 2001) defines measures to achieve strategic goals of the national policy.

Energy Audit Programmes

There are no specific energy audit programmes in Lithuania.

Other Programmes including Energy Audits

Energy Efficiency Housing Pilot Project (EEHPP)

The Energy Efficiency Housing Pilot Project supported public and private initiatives in improving energy efficiency of residential buildings and public schools. The major focus of the project was placed on the implementation of proposed energy efficiency measures but energy audits and thoroughly prepared investment projects were important components of the project setup.

The Housing and Urban Development Foundation was assigned as the EEHPP implementation unit and was responsible for overall coordination of the project activities including energy auditing component. In the project framework a special energy audit format was developed for participating energy consultants.

Energy audits of residential and public buildings were performed by private energy consulting companies. There were no formal restrictions for participating companies. With assistance of Danish and Dutch experts an extensive training program focusing on energy auditing and preparation of investment projects was carried out. Altogether around 150 energy consultants were trained in 1997 - 1999.

From the project commencement in 1996 till the second half of 1999 all costs associated with preparation of energy audits and investment projects for participating homeowners associations were paid from Dutch technical support funds. These funds helped to perform around 150 free of charge energy audits of residential buildings. In total 584 energy audits of residential buildings and 53 energy audits of public schools were performed since project commencement in 1996 till December 1, 2002.

Upgrades of residential buildings will continue to be financed from repaid funds as long as they are available (the World Bank loan was for 20 years). Nevertheless there are no additional funds for subsidizing or promotion of energy audits.

Municipal Infrastructure Development Program 2000 – 2004 (MIDP)

The Municipal Infrastructure Development Program supported development of municipal infrastructure in order to improve quality and efficiency of services provided by municipalities including infrastructure maintenance and strengthen municipal capacity in planning and financial management. Energy auditing was compulsory for municipalities seeking financing for renovation of public schools.

Overall coordination of the program activities was performed by the Housing and Urban Development Foundation. Technical assistance funds covered some portion of project preparation and implementation costs but in the case of school renovation municipalities had to cover all costs of compulsory energy audits. Energy audits of residential and public buildings were performed by private energy consulting companies and there were no formal restrictions for participating companies. Several seminars were conducted for both municipal employees and potential energy consultants.

In total 121 energy audit of public school buildings was performed. There are no plans to use remaining program funds for demand side energy efficiency investments, therefore no energy audits are planned in the framework of the MIDP.

Education Improvement Project (EIP)

The Education Improvement Project aims at improvement of teaching quality and more efficient use of the financial, human and physical resources allocated to the education system. Energy auditing is compulsory for municipalities seeking financing for renovation of public schools.

Implementation framework of the energy efficiency sub-component of the EIP involves the Ministry of Education and Science, the Housing and Urban Development Foundation and participating municipalities. Energy audits of residential and public buildings were performed by private energy consulting companies and there were no formal restrictions for participating companies. During the project preparation a standard school energy audit methodology was prepared by a private energy auditing company (member of the Lithuanian Energy Consultants Association).

In total energy audits in 62 selected schools were performed. No more audits are planned in the framework of the EIP.

Other Activities including Energy Audits

Housing Advisory Agency (HAA)

The Housing Advisory Agency was established in 2001 on the basis of regional advisory centers which were created to support homeowners participating in the Energy Efficiency Housing Pilot Project. The main task of the HAA is to provide counseling and training services to homeowners and municipalities. The HAA promotes rational use of energy resources and proper management of residential and public buildings.

Since 1997, staff of the HAA conducted over 300 energy audits of residential buildings. In an attempt to evaluate feasibility of investments in energy efficiency the HAA also conducted technical and social monitoring of 96 building renovation projects implemented in the framework of the EEHPP. More detailed monitoring of 50 building renovation projects is planned for 2002 / 2003 heating season. The

agency is also planning to perform pilot Energy Performance Certification of 50 residential multifamily buildings as a part of the Danish Energy Authority funded project

Lithuanian Energy Consultants Association (LECA)

Established on December 14, 2000, the Lithuanian Energy Consultants Association currently consists of 12 member companies and individuals involved in actual energy auditing activities. The LECA strives to (a) represent and protect interests of its members; (b) strengthen the capacity of its members by providing legal assistance, training and tools; (c) participate in preparation and implementation of legal acts related to energy consulting; (d) ensure professional ethics of energy consultants and stimulate fair competition and (e) promote energy conservation.

Members of the LECA provide energy consulting services, including auditing, to a wide range of public and private clients involved in energy production, distribution and consumption. Members of the LECA conducted approximately 500 energy audits. Out of this number more than a half them were audits of residential buildings and around 150 audits of public schools.

Members of the LECA also actively participated in the Dutch funded Matra Pre-accession program aimed at the development of Energy Performance Certification program of residential and public buildings.

Energy Efficiency Center (EEC)

The Energy Efficiency Center was established in April 1995 by the Ministry of Energy as a division of the State company "Energy Agency" of Lithuania. The major objective of the EEC is to promote demand side energy efficiency in Lithuania and ensure that energy efficiency measures are implemented effectively. The EEC office in Vilnius is also a platform for national and international activities in the field of energy efficiency.

The EEC provides informational and advisory services on energy efficiency issues, including energy auditing to a wide range of clients. The major target sectors of the EEC activities are industrial facilities, public (schools, hospitals, kindergartens, etc.) and residential buildings. The major clients are managers of industries and buildings, municipal and governmental employees and households. In total the EEC staff carried out 7 audits of industrial facilities and 23 audits of municipal buildings.

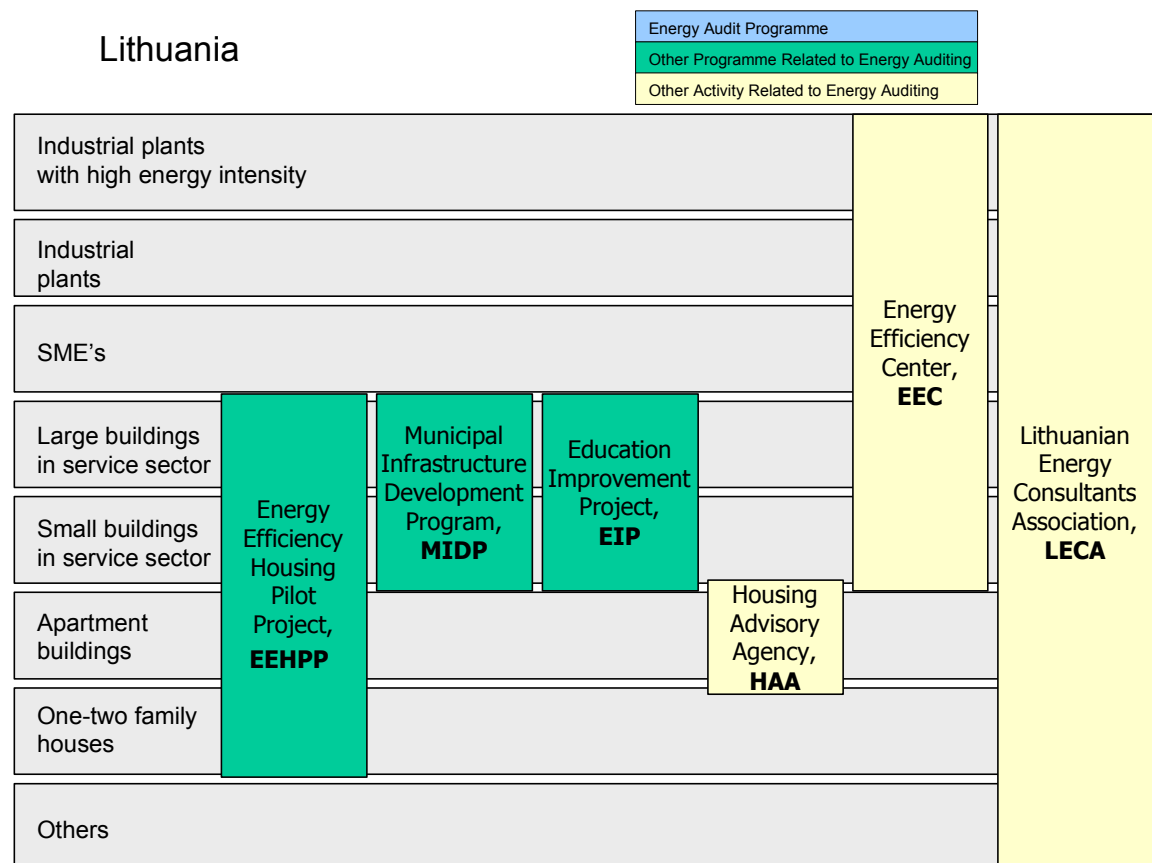


Figure 1. The Map of energy audits in Lithuania

Table of EAP features coverage

	EEHPP	MIDP	EIP	+++ = Detailed information; ++ = Some information; + = Very little information; = No information.
Status	1996-	2000-	2002-	
Administration	+++	+++	+++	
EA models	+	+	++	
Auditor's tools	+++	++	+++	
Training, authorization	+++	++	+++	
Quality control	+++	+++	+++	
Monitoring	+++			
Volumes, results	+++	+++	+++	
Evaluation	++	+		

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Country Report

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Disclaimer

The information contained in this report has been gathered from publicly available sources and through interviews, therefore despite substantial efforts the authors can not guarantee the accuracy of the content.

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1 Background and Present National Energy Policy

1.1 Previous activities

There were no country-wide programs targeted solely on energy auditing in Lithuania during the last decade. A number of projects and programs in residential and public sectors included energy auditing as a compulsory component of more general framework.

The Energy Efficiency Housing Pilot Project (EEHPP) can be classified as one of the Other Programmes including Energy Audits. Energy auditing was a component of the project aimed at ensuring cost-effectiveness and technical soundness of energy efficiency investments and advancement of energy consulting services in the country. The project major objectives were to support private initiatives to improve residential energy efficiency and to support public initiatives in improving energy efficiency in schools. The project objectives were to be achieved through: (a) provision of loans for technically and economically attractive packages of energy efficiency measures; (b) introduction of the concept of long-term lending for housing improvement to the commercial banking sector; (c) development of energy consulting services and (d) support for municipalities in the energy efficiency rehabilitation of schools. The World Bank extended US\$ 10 million loan for the project and the Lithuanian government agreed to provide 30% of matching funds. The Danish Ministry of Housing and Urban Affairs and the Dutch Ministry of Economics provided the main technical assistance funds.

331 energy audit of residential buildings and 53 audits of secondary schools and kindergartens were prepared since project commencement in late 1996 till closure of the original phase on June 30th, 2001. The second phase of the project which involves re-lending of funds repaid by residential borrowers will continue as long as funds are available (the World Bank loan was for 20 years).

During the past several years a number of training programs were conducted for energy consultants on issues related to energy auditing. In 1994 - 1995 the ENSI (Energy Saving International AS, Norway) carried out a training program (4 seminars) on topic "Energy Efficiency in Buildings" at the Lithuanian Energy Institute. Workshop certificates were awarded to 9 participants.

In 1997 a training program was prepared (Lithuanian - Danish project involving Danish Technological Institute, the Lithuanian Energy Institute, Vilnius Gediminas and Kaunas Technical Universities) and the pilot training course for energy auditors of buildings carried out at the Energy Efficiency Center in Vilnius. The training material included information on energy audits, analysis of building constructions, heating and hot water systems, ventilation and air conditioning installations, financing opportunities and other issues. Since 1997 more than 100 persons participated in the training and were awarded with certificates.

Since 2001 Vilnius Gediminas technical university established the Sustainable Energy Development training center on basis of Baltic - Danish network, which has a training program for energy consultants. The university provides a module for Master students called "Energy Audit".

1.2 Present national energy policy

1.2.1 Legal framework

Energy audit is mentioned in the Lithuanian Energy Act and Technical Regulation No. 1.12.05:2002 issued by the Ministry of Environment and titled "Compulsory requirements for maintenance and use of residential buildings and implementation order".

The Energy Act formulates description of an energy audit in general and in one of its chapters calls for development of incentives for state and municipal institutions to conduct energy

audits of their facilities. The Technical Regulation also formulates a description of an energy audit of a building and stipulates who and how initiates audits of residential buildings.

As of December 2002, there were no formal standards or requirements for energy auditors or energy audits. Clients usually require potential energy consultants to indicate their former auditing experience and present certificates proving their qualifications in technical design or technical supervision of construction works.

The Lithuanian Energy Consultants Association drafted a set of requirements for energy auditors and presented them to the Ministries of Environment and Economy together with an appeal on establishment of formal certification of energy auditors and formal requirements for energy audits. By the end of 2002 the Ministry of Economy drafted a regulation titled "Order of energy auditing and monitoring of buildings, enterprises, transport and other sectors of the economy". This regulation formulates major terms related to energy audit and monitoring, stipulates audit and monitoring goals, models, implementation order, describes administration of this order, authorization procedures of energy auditors and subsidy policy and order.

1.2.2 National Energy Strategy

Lithuanian energy policy is being updated once in every five years through the National Energy Strategy (NES). The last NES was adopted on October 10, 2002 by the Lithuanian Parliament. In this document a number of European Union legal acts, the Energy Charter Treaty and other international treaties were taken into account. Lithuanian energy sector is planned to be environmentally friendly, integrated into the Western and Eastern energy systems, competitive in an open international energy market and create favorable conditions for further economic progress. The share of power produced in CHP stations should make not less than 35% in the total balance of power production and share of renewable energy resources should make up to 12% in the total balance of primary energy till 2010.

Lithuanian environmental strategy emphasizes need to develop and implement policies and programs aiming at Lithuania's compliance with the EU environmental directives as well as with nuclear safety requirements and prepare for the decommissioning of the reactors of the Ignalina Nuclear Power Plant, including safe disposal and storage of radioactive waste.

1.2.3 The National Energy Efficiency Programme (NEEP)

The latest NEEP (updated on September 19, 2001) estimates that 20 to 50% of the currently consumed energy resources may be saved. There are substantial opportunities for energy efficiency in all sectors of the economy. The NEEP includes the following activities:

- development of relevant legal and regulatory framework;
- retrofitting of existing buildings and upgrading of their energy facilities;
- intensification of use of indigenous, renewable and waste energy resources;
- increase of energy efficiency in production processes;
- development of informational, educational activities and counseling.

New legal framework will ensure compliance with the requirements of EU directives in the field of energy efficiency. Energy efficiency, indigenous, renewable and waste energy will be supported by Special Programme for the Implementation of Energy Saving Measures. Renovation of residential and public buildings will be further financed using loans administered by the Housing and Urban Development Foundation and private financial institutions. Wider use of the EU structural funds is expected.

Energy related environmental measures will primarily aim at reduction of greenhouse gas emissions in the light of decommissioning of Ignalina Nuclear Power Plant. For that purpose all combustion plants will have to reconsider the fuel mix to meet new requirements in 2008. Priority will be given to indigenous and renewable energy resources. Wider application of economic measures promoting pollution reduction and implementation of environmentally

friendly technologies as well as further development and improvement of the environmental taxation system by introducing pollution trading systems, green certificates systems and other measures will be implemented.

The NEEP includes a number of measures for 2001 - 2005 which are relevant to energy auditing, such as:

- Development and legalization of procedures for performance and monitoring of energy audits. Financing of 75,000 Lt (approx. 21,700 EUR) is allocated from the State budget;
- Development of a programme for building energy auditing and certification in accordance with the EU Directive 93/76/EEC. Financing of 125,000 Lt (approx. 36,000 EUR) is allocated from the State budget;
- Performance of energy audits and monitoring of buildings to evaluate efficiency of energy consumption and develop measures to increase energy efficiency. Financing of 2 million Lt (approx. 580,000 EUR) is expected from various financing sources;
- Development of educational programmes for children and students on issues of indigenous, renewable and waste energy resources. Financing of 300,000 Lt (approx. 87,000 EUR) is allocated from the State budget.

2 Energy Audit Programmes

There are no specific energy audit programmes in Lithuania.

3 Other Programmes including Energy Audits

3.1 Energy Efficiency Housing Pilot Project (EEHPP)

As it was already mentioned in Chapter 1.1 the original part of the EEHPP was terminated on June 30, 2001 but the second phase of the project continues therefore in this Chapter some details will be provided. Energy auditing was compulsory for homeowners associations applying for soft loans for renovation of residential multifamily buildings.

3.1.1 Goals

Overall goal of the EEHPP was to support public and private initiatives in improving energy efficiency of residential buildings and public schools. The major focus of the project was placed on the implementation of proposed energy efficiency measures but in the absence of mortgage technical and financial risks were partly offset by professional energy audits and thoroughly prepared investment projects.

Prior to the project commencement there was very limited understanding on feasibility and saving potential of various energy efficiency measures in Lithuanian residential and public buildings. The capacity of local energy consultants was also rather limited therefore substantial efforts were needed to boost energy consulting services in the country. As result capacity building component was included in the general framework of the project.

3.1.2 Target sectors

The Energy Efficiency Housing Pilot project targeted residential sector with emphasis on multifamily buildings constructed during the soviet times and public school buildings. Therefore municipalities, individual homeowners and especially homeowners associations were the main clients of the project.

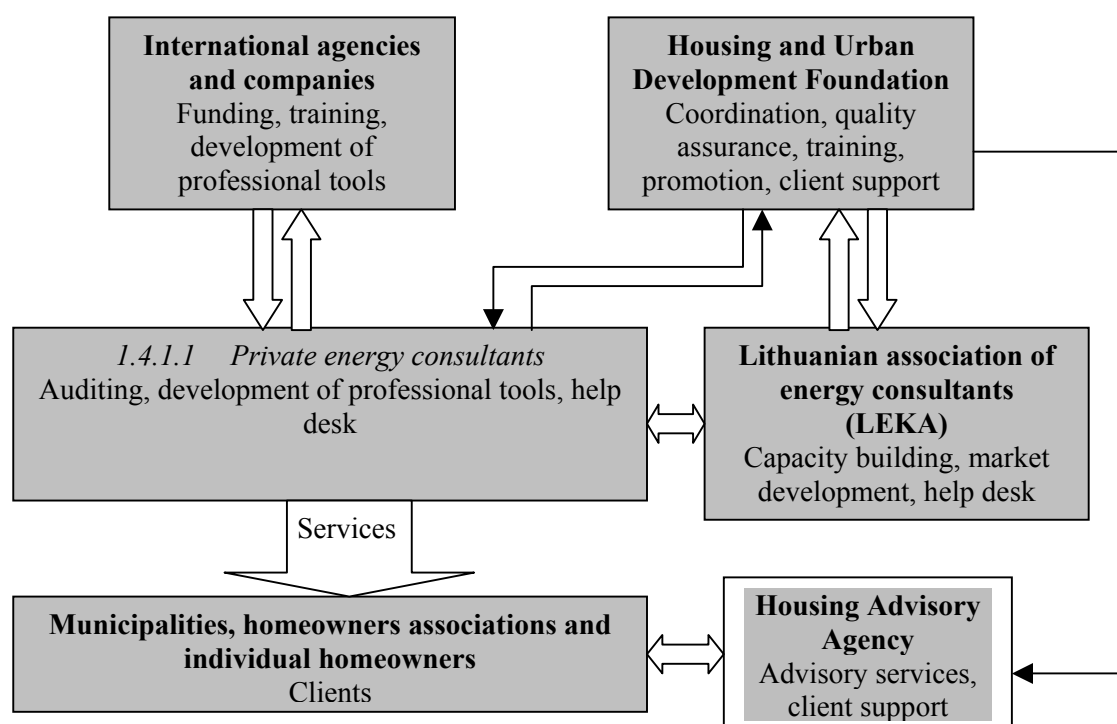
Soft loans to the residential borrowers were channeled via commercial banks, whereas municipalities were obtaining loans directly from the Ministry of Finance of Lithuania.

3.1.3 Administration

The Housing and Urban Development Foundation (HUDF), an agency established by the Ministry of Finance of Lithuania, was assigned as the EEHPP implementation unit and was responsible for overall coordination of the project activities including energy auditing component. In addition to the foundation staff and experts from the World Bank, a number of other stakeholders were involved in activities related to development of energy consulting services in Lithuania, i.e. *Senter Internationaal* agency and TNO Building and Construction Research (*Bouw*) company from Netherlands, Knudsen & Sorensen K/S company from Denmark and local energy consulting companies, the Energy Efficiency Center, regional centers of the Housing Advisory Agency, research institutions and universities. Due to diverse structure of the project funding, all planning, administration and training activities were performed in close cooperation with all stakeholders and numerous tasks were performed by various actors. The HUDF provided overall support for the involved parties and with assistance of the most professional local companies the quality control was performed.

Energy audits of residential and public buildings were performed by private energy consulting companies. There were no formal restrictions for participating companies. The most experienced companies and private auditors were actively involved in preparation of professional tools, consulting of less experienced colleagues and technical monitoring of the performed building renovations.

The key players can be presented in the following scheme:



3.1.4 Implementing instruments

Subsidies and technical assistance

From the project commencement in 1996 till the second half of 1999 all costs associated with preparation of energy audits and investment projects for participating homeowners associations were paid from Dutch technical support funds. These funds helped to perform around 150 free of charge energy audits of residential buildings, which created additional demand for services of private energy consultants and helped to overcome initial cost barrier for homeowners associations. The Dutch funds were also used for technical and social

monitoring of the performed renovations thus generating needed technical and economic data. In addition Dutch and Danish experts conducted numerous training courses for local consultants, assisted in development of professional tools and helped with technical and social monitoring of performed projects.

However a significant fraction of performed energy audits and prepared investment proposals did not result in signed loan agreements and implemented projects and loan disbursements fell behind the schedule in 1998. Numerous homeowners still perceived the loan as "too expensive" and associated with substantial transaction costs and therefore did not proceed beyond free energy audits. Therefore in 1999 the Lithuanian Government decided to introduce 30% investment grant for participating homeowners associations. The EEHPP loan recipients were also exempt from the VAT tax.

Attractive loan conditions and streamlined activities of all stakeholders helped to maintain the project momentum and the removal of subsidies for preparation of energy audits and investment projects in the second half of 1999 did not reduce household willingness to participate. Costs of energy consulting services were covered by residential clients since then.

Municipalities applying for the EEHPP loan had to cover energy auditing and project preparation costs by themselves since commencement of the project.

3.1.5 Auditor's tools

In the framework of the EEHPP project a special energy audit format was developed for participating energy consultants. Energy audit report for residential buildings consisted of: (a) introduction, (b) the main technical data of a building, (c) building condition description and actual energy consumption, (d) building thermal characteristics, (e) conclusions of analyses and recommendations for building improvement, (f) detailed description of proposed energy efficiency measures, their costs and feasibility and (g) recommended energy efficiency measures.

In addition comprehensive guidelines for energy consultants were developed by Lithuanian energy auditors with Dutch technical assistance. The guidelines consisted of the following parts:

1. INTRODUCTION
2. ENERGY AUDIT
 - 2A. Application to perform the energy audit (for the homeowners association)
 - 2.1 DETERMINATION OF PROBLEMS AND DATA COLLECTION
 - 2.1A Meeting with association - control list of questions
 - 2.1B Examples of energy saving measures
 - 2.1C Information of association and its building
 - 2.1D Questionnaire for apartment owners
 - 2.2 EXAMINATION OF THE BUILDING AND TECHNICAL INSTALLATIONS
 - 2.2A Methods of conditions investigation of building and its systems
 - 2.2B List of building examination
 - 2.3 ANALYSES OF THE ENERGY CONSUMPTION
 - 2.3A Data of temperatures and degree-days
 - 2.3B Heat balance of residential building
 - 2.3C Recalculation of actual heat consumption of residential building for normative conditions
 - 2.3D Theoretical determination of annual heat demand and necessary heat power of residential building (heat losses)
 - 2.3E Comparative factors of annual heat losses in Lithuania

- 2.3F Recommendations of determination of characteristic areas of building
- 2.3G Assumptions of the indoor air temperatures and air change in calculations
- 2.4 ENERGY SAVING MEASURES: REQUIREMENTS, INVESTMENTS AND SAVING
 - 2.4A Technical efficiency of modernization of heating system
 - 2.4B Efficiency and prices of energy saving measures
 - 2.4C Decisions on prices of natural gas, electricity and DHW
- 2.5 GGNEVA COMPUTER PROGRAMME FOR ANALYSES OF ENERGY CONSUMPTION
 - 2.5.1 Introduction, short characteristics
 - 2.5.2 Data and results
 - 2.5.3 Installation and work start
 - 2.5.4 Work with program
 - 2.5.5. Information worksheet
 - 2.5.6. Worksheets of data input
 - 2.5.7. Worksheets of results
- 2.6 ENERGY AUDIT REPORT (EXAMPLE OF FORM)
- 2.7 EXAMPLES OF ENERGY AUDITS PERFORMED APPLYING COMPUTER PROGRAMME GGNEVA
- 3 INVESTMENT PROJECT
 - 3.1 INTRODUCTION ABOUT INVESTMENT PROJECT
 - 3.2 PREPARATION OF INVESTMENT PROJECT (IP)
 - 3.3 IP GENERATOR
 - 3.3.1 Introduction
 - 3.3.2 Primary data, their input
 - 3.3.3. Remarks on data input
 - 3.3.4 Nine steps (actions) how to prepare the IP report applying IP Generator
 - 3.4 INVESTMENT PROJECT (EXAMPLE OF FORM)
 - 3.5. INVESTMENT PROJECT CARRIED BY APPLYING IP GENERATOR
- 4. FACTUAL HEAT CONSUMPTION OF VILNIUS RESIDENTIAL BUILDINGS FOR STANDARD YEAR ACCORDING DATA OF HEATING SEASON 1998-1999.
- 5. RESULTS OF MONITORING

There were no formal requirements for contents of audits of public schools. Based on the experience of the EEHPP project the Housing and Urban Development Foundation established (since November 2000) an order for preparation of energy audits in residential and public buildings for participants of projects administrated by the foundation but this order falls short of clear energy audit model.

3.1.6 Training, authorization and quality control

The Housing and Urban Development Foundation with assistance of Danish and Dutch experts carried out an extensive training program focusing on energy auditing and preparation of investment projects for energy consultants participating in the EEHPP project. Altogether around 150 energy consultants were trained in 1997 - 1999.

Energy audits of residential and public buildings were performed by private energy consulting companies. There were no formal restrictions for participating companies. About 20 trained energy consultants were contracted to perform services under the project. The most active energy consultants initiated the Lithuanian Energy Consultants Association in 2000. Members of this association actively participated in the EEHPP implementation.

Energy audits performed in the framework of the EEHPP were randomly verified. In addition there was a help desk system that provided an opportunity for less experienced auditors to consult on more problematical issues with local experts.

Due to lack of funding both the quality control and the help desk systems were not operational since 1999. In some regions of the country low awareness of clients (homeowners associations or municipalities) on requirements for energy auditing resulted in decline of the quality of performed audits since then.

3.1.7 Monitoring, results and evaluation

With Dutch technical assistance 18 residential and 2 school projects implemented in 1997 and 1998 were monitored. Monitoring included three aspects: social, technical and financial. The social component of the monitoring investigated homeowners' motivations to start a project, its implementation progress, perception of renovation results and problems that occurred during the implementation. In the financial part cost-effectiveness of investments, perceptions of the bank and its financial procedures, financial burden and loan repayment issues were analyzed. The technical part analyzed accuracy of calculations of expected savings, efficiency of implemented energy efficiency measures. The technical monitoring analysis was based on the documentation of implemented projects: (a) energy audit reports, (b) investment projects, (c) characteristics of a building and a heating system, (d) energy consumption data before and after renovations.

Monitoring results demonstrated that initial estimates of energy savings were quite far away from actually achieved ones. In addition most of projects implemented in 1997 and 1998 included very limited improvements mainly related to modernization of heat substations, whereas projects implemented in 1999 - 2001 included broad range of measures such as insulation of walls and roof, window replacement, individual heat cost meters, etc. Therefore to have better quality energy consulting services additional monitoring activities were needed, but due to lack of funding monitoring activities were scaled down.

The Housing Advisory Agency implemented simplified monitoring program of 96 residential projects in 2000 - 2001. The monitoring showed very large spread in savings, from additional consumption to more than 50% savings with average value for normal year of 17 % (without adjustment for comfort change). In reality based on results of interviews many households increased indoor comfort after building renovations therefore comfort adjusted savings were higher.

The overall evaluation of the EEHPP was performed by the World Bank staff upon completion of the original part in 2001.

3.1.8 Auditing volumes

253 energy audits of residential multifamily buildings were prepared since July 1, 2001 till December 1, 2002 in the framework of the second phase of the EEHPP.

3.1.9 Observations and future plans

The project showed that homeowners' associations and municipalities were able to implement sophisticated energy efficiency projects if provided with institutional and technical support and financial incentives. Professionally performed energy audits contributed to the success of the project, but more monitoring activities were needed for further refinement of energy auditing tools and approaches.

Upgrades of residential buildings will continue to be financed from repaid funds as long as they are available (the World Bank loan was for 20 years). Nevertheless there are no additional funds for subsidizing or promotion of energy audits or monitoring of implemented projects.

The Lithuanian government is currently preparing the National Housing Strategy and efficient management of existing housing is one of the major goals. This entails substantial improvement of energy efficiency of residential buildings but concrete programs and tools are to be chosen in 2003.

3.2 *Municipal Infrastructure Development Program (MIDP) 2000 – 2004*

Energy auditing is compulsory for municipalities seeking financing for renovation of public schools in the framework of the MIDP. Energy efficiency measures were implemented in 121 public school in 2001.

3.2.1 Goals

The major goals of the Municipal Infrastructure Development Program are to support development of municipal infrastructure, improve quality and efficiency of services provided by municipalities including infrastructure maintenance and strengthen municipal capacity in planning and financial management.

3.2.2 Target sectors

The program consists of: (a) preparation and implementation of municipal investment projects; (b) technical assistance and grant support to municipalities for preparation and implementation of investment projects and (c) training of municipal staff in areas of project planning and financial management. Major clients of the program are municipalities and municipal enterprises. The MIDP finances investment projects related to environmental protection, district heating, energy efficiency improvements, water supply and wastewater treatment and other municipal infrastructure improvements.

3.2.3 Administration

Overall coordination of the program activities is performed by the Housing and Urban Development Foundation. The MIDP is financed from the World Bank, the Nordic Investment Bank and the European Investment Bank loans. External technical assistance is provided by the governments of Japan, Denmark, Sweden and Finland. Due to diverse structure of project financing a number of activities are supervised and financed by agencies and ministries of donor countries. Association of Lithuanian Municipalities coordinated training activities of municipal personnel.

3.2.4 Implementing instruments

Technical assistance funds covered some portion of project preparation and implementation costs of a number of environmental and district heating projects. But in the case of school renovation municipalities had to cover all costs of compulsory energy audits.

3.2.5 Training, authorization and quality control

There were no formal restrictions for participating companies. Several seminars were conducted for both municipal employees and potential energy consultants. 31 company was involved in energy auditing and preparation of investment projects. Prepared energy audits and investment projects were verified by the HUDF to ensure their compatibility with requirements of the MIDP.

3.2.6 Auditor's tools

The Housing and Urban Development Foundation furnished participating energy consultants with simple guidelines for preparation of energy audits and investment projects. But this order provides details on composition of energy audit report and falls short of clear energy audit model.

3.2.7 Auditing volumes

121 energy audit of public school buildings was performed in 2001.

3.2.8 Observations and future plans

There are no plans to use remaining program funds for demand side energy efficiency investments, therefore no energy audits are planned in the framework of the MIDP. Nevertheless successful renovation of public schools supported Lithuanian governmental plans to proceed with the World Bank funded *Education Improvement Project*, which includes energy efficiency improvement in public schools as a separate component of the project.

3.3 *Education Improvement Project (EIP)*

The EIP is the World Bank financed project approved on June 20, 2002. Energy auditing is compulsory for municipalities seeking financing for renovation of public schools. Energy efficiency measures are planned to be implemented in 62 public schools.

3.3.1 Goals

The EIP aims at improvement of teaching quality and more efficient use of the financial, human and physical resources allocated to the education system.

3.3.2 Target sectors

The project will support municipalities in their efforts to optimize school network and ensure rational use and improved energy efficiency of educational facilities. In total 400 schools are planned to be involved in the project. One out of five project components includes improvement of energy efficiency of facilities of 62 primary schools.

3.3.3 Administration

Implementation framework of the energy efficiency sub-component of the EIP involves the Ministry of Education and Science (MES), the Housing and Urban Development Foundation and participating municipalities.

The MES plays a key role by supporting municipalities in the selection of schools, in conducting energy audits of these schools, and in the approval of each investment project. Upon approval of an investment project by the MES, implementation contracts are signed between the MES, municipalities and the HUDF.

Municipalities are directly involved in the selection of schools, preparation of the detailed design, procurement, supervision and evaluation. They are responsible for financing of 25% of the total cost involved in school rehabilitation. Each municipality is to select a school for renovation in accordance with selection criteria developed during project preparation.

The HUDF plays supporting, monitoring and control role in the implementation of the energy efficiency sub-component. Foundation staff is directly involved in the evaluation of school investment plans, procurement planning, preparation of Terms of Reference for detailed

design and overall supervision of the bidding process. The HUDF evaluates energy audits and investment projects (IPs) and provides IP Evaluation Reports to the MES.

3.3.4 Implementing instruments

Energy auditing is compulsory for municipalities seeking financing for renovation of public schools in the framework of the EIP.

3.3.5 Training, authorization and quality control

Energy audits were performed by private energy consulting companies. There were no formal restrictions for participating companies.

The HUDF tasks are to evaluate energy audits and investment projects, prepare the IP Evaluation Reports and submit them to the MES for approval.

In addition to school renovation, personnel and students of the renovated schools will be trained to save heat and electricity, and maintain renovated constructions of the buildings and the installed equipment. A number of studies in the renovated schools will be conducted aimed at assessing the technical aspects of interventions and the cost-efficiency of the investments.

3.3.6 Auditor's tools

During the project preparation a standard school energy audit methodology was prepared by a private energy auditing company (member of the LECA) as per order of the Ministry of Education and Science. This methodology was used to identify individual renovation needs for each of selected schools.

3.3.7 Auditing volumes

Energy audits in 62 selected schools were performed.

3.3.8 Observations and future plans

As of December 2002, all 62 energy audits were conducted and 9 tri-lateral agreements between municipalities, the MES and the HUDF were signed. 40 schools are planned to be renovated in 2003 and staff and students of these schools trained.

4 Other Activities including Energy Audits

4.1 *Housing Advisory Agency (HAA)*

The Housing Advisory Agency was established in 2001 on the basis of regional advisory centers which were created to support homeowners participating in the Energy Efficiency Housing Pilot Project. Since 1997, staff of the HAA provided counseling on energy efficiency issues and conducted over 300 energy audits of residential buildings.

4.1.1 Goals

The main task of the HAA is to provide counseling and training services to homeowners and municipalities. The HAA promotes rational use of energy resources and proper management of residential and public buildings. Energy auditing is one of the tools to raise awareness on energy efficiency opportunities in housing.

4.1.2 Target sectors

The HAA focuses its efforts on residential multifamily buildings constructed before introduction of new energy efficiency standards in 1992. Major client groups are homeowners, homeowners' associations, housing administrators (managers) and municipal personnel involved in the housing sector.

4.1.3 Implementing instruments

The agency staff provides free counseling for participants of the EEHPP in all stages of project implementation. Members of homeowners' associations can get advice on technical, legal, managerial and financial issues. The HAA is also involved in training activities on energy management and housing administration, which are co-financed by donor countries and international agencies (such as the Global Environmental Facility).

In an attempt to evaluate feasibility of investments in energy efficiency the HAA conducted technical and social monitoring of 96 building renovation projects implemented in the framework of the EEHPP, thus generating useful data for energy consultants and other interested parties.

4.1.4 Volumes

In the framework of the EEHPP the agency staff conducted over 300 energy audits of residential multifamily buildings in various locations of Lithuania.

4.1.5 Observations and future plans

The Housing Advisory Agency providing comprehensive support for homeowners was one of the key elements ensuring successful implementation of the EEHPP. Energy auditing was only a supplementary activity for the agency mainly to cover capacity gaps in some regions or to produce data for general use. More detailed monitoring of 50 building renovation projects is planned for 2002 / 2003 heating season.

In the future the HAA will continue its counseling and training activities in the housing sector. The agency also expects to have its role in the Energy Performance Certification (EPS) program of residential and public buildings, which was developed in the framework of the Dutch funded Matra Pre-accession program. Pilot certification of 50 residential multifamily buildings is planned for 2003 as a part of the Danish Energy Authority funded project.

4.2 *Lithuanian Energy Consultants Association (LECA)*

Established on December 14, 2000, the Lithuanian Energy Consultants Association currently consists of 12 member companies and individuals involved in actual energy auditing activities.

4.2.1 Goals

The LECA strives to (a) represent and protect interests of its members; (b) strengthen the capacity of its members by providing legal assistance, training and tools; (c) participate in preparation and implementation of legal acts related to energy consulting; (d) ensure professional ethics of energy consultants and stimulate fair competition and (e) promote energy conservation.

4.2.2 Target sectors

Members of the LECA provide energy consulting services, including auditing, to a wide range of public and private clients involved in energy production, distribution and consumption. Energy audits were performed in public, residential, commercial and industrial buildings. Members of the LECA also actively participated in the Dutch funded Matra Pre-

accession program aimed at the development of Energy Performance Certification program of residential and public buildings.

4.2.3 Administration

The LECA is governed by the Annual General Assembly of its members and presidium consisting of a president and 4 members elected for 2 years. Everyday activities are carried out by administration consisting of director and financial officer appointed by the Presidium.

4.2.4 Implementing instruments

The LECA provides legal assistance and training for its members and actively lobbies establishment of legal and regulatory framework for energy auditing. The association also developed Code of Professional Ethics, which should stimulate fair competition among energy consultants. Members of the association also are involved in numerous activities promoting energy conservation and use of renewable energy resources.

4.2.5 Volumes

Members of the LECA conducted approximately 500 energy audits. Out of this number more than a half of them were audits of residential buildings and around 150 audits of public schools. These numbers include energy audits performed in the framework of the State supported programs and audits of other facilities (hospitals, administrative buildings, universities, industry and etc.).

4.2.6 Observations and future plans

The association can potentially develop into an effective institution able to ensure high quality energy auditing services and comprehensive support for its members. Members of the association are planning to take an active role in the Energy Performance Certification of residential and public buildings. Financing of its activities taking into account limited financial capacity of its members is one of the biggest challenges.

4.3 *Energy Efficiency Center (EEC)*

The Energy Efficiency Center was established by the Ministry of Energy as a division of the State company "Energy Agency" of Lithuania in April 1995. The EEC was involved in a number of activities related to energy auditing.

4.3.1 Goals

The major objective of the EEC is to promote demand side energy efficiency in Lithuania and ensure that energy efficiency measures are implemented effectively. The EEC office in Vilnius is also a platform for national and international activities in the field of energy efficiency.

4.3.2 Target sectors

The major target sectors of the EEC activities are industrial facilities, public (schools, hospitals, kindergartens, etc.) and residential buildings. The major clients are managers of industries and buildings, municipal and governmental employees and households. The EEC staff is also actively involved in general public awareness programs on rational use of energy resources.

4.3.3 Implementing instruments

The EEC provides informational and advisory services on energy efficiency issues, including energy auditing to a wide range of clients. This includes seminars, workshops and training

courses on different aspects of energy efficiency for energy managers of municipal institutions (hospitals, schools, office buildings) and energy consultants. Since 1997 approximately 200 energy auditors were trained by the EEC staff on new auditing methods and tools.

The EEC also houses a permanent exhibition of modern energy efficient technologies and a library containing materials on energy efficiency and renewable energy resources. The center staff participates in numerous national and international projects and also in development of legal and institutional framework for energy efficiency.

4.3.4 Volumes

The EEC staff carried out 7 audits of industrial facilities and 23 audits of municipal buildings.

4.3.5 Future plans

The EEC will continue its informational and training activities related to energy auditing.

5 References

Reference material:

- National energy strategy. //approved 10th October 2002;
- National energy efficiency programme (updated). // approved 19th September 2001.

Web-sites

- www.ekm.lt
- www.ena.lt
- www.eec.lt
- www.hudf.lt
- www.leka.lt

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1 EUR = 3.4528 Lt
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